

Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An article cleaning apparatus comprising:
an air management mechanism;
a cleaning basket assembly;
a fluid regeneration device;
a working fluid device coupled to said fluid regeneration device, said cleaning basket assembly, and said air management mechanism;
a clean fluid device coupled to said cleaning basket assembly and said fluid regeneration device;
a controller coupled to said air management mechanism, said cleaning basket assembly, said working fluid device, said fluid regeneration device, and said clean fluid device,device; wherein said controller ~~is configured to controls~~ a cleaning process, ~~including at least~~ a solvent cleaning process, ~~wherein said solvent cleaning process~~ ~~that~~ utilizes a solvent based cleaning fluid comprising a cyclic siloxane solvent; and
a solvent contaminant detection device ~~coupled to~~^{coupled to} the fluid regeneration device ~~that~~^{to} determines an amount of ~~a~~ solvent contaminant that ~~may accumulated~~ in the solvent ~~using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminant.~~
2. (currently amended) The article cleaning apparatus of claim 1 wherein ~~said solvent contaminant detection device comprises an electromagnetic source is an ultraviolet source and said electromagnetic detector is an ultraviolet detector~~ ~~responsive to contaminant absorbance of electromagnetic radiation.~~

3. (currently amended) The article cleaning apparatus of claim 12 wherein said electromagnetic device consists of a source is and detector selected from the group consisting of an ultraviolet source and ultraviolet detector, and an infrared source and said electromagnetic detector is an infrared detector.

4. (currently amended) The article cleaning apparatus of claim 12 wherein said solvent contaminant detection electromagnetic device comprises an ultraviolet device including an ultraviolet source, a flow-through cell for passing samples of the siloxane solvent from the fluid regeneration device, and an ultraviolet detector responsive to ultraviolet radiation radiated from the ultraviolet source through the flow-through cell.

5. (currently amended) The article cleaning apparatus of claim 4 wherein said solvent contaminant detection ultraviolet device further comprises a filter that is configured to pass ultraviolet frequencies in a bandpass responsive to the presence of at least one contaminant likely to accumulate in the solvent.

6. (currently amended) The article cleaning apparatus of claim 5[[4]] wherein said at least one contaminant comprises a family of contaminants.

7. (currently amended) The article cleaning apparatus of claim 1 wherein said solvent contaminant detection device is coupled to the controller to generate a signal when a concentration of contaminants present in the solvent reaches a predefined limit.

8. (currently amended) The article cleaning apparatus of claim 7 wherein said predefined limit is chosen to indicate degradation in a regeneration adsorption media in said fluid regeneration device.

9. (currently amended) The article cleaning apparatus of claim 1 further comprising a turbidity sensor in combination with the solvent contaminant

~~detection device, wherein said turbidity sensor is configured to detect the presence of particulates in the solvent that are readily visible, and said solvent contaminant detection device is configured to detect the presence of dissolved contaminants in the solvent that are not readily visible.~~

10. (currently amended) A solvent contaminant detection device used in a dry cleaning apparatus that~~configured to~~ detects the presence of dissolved contaminants in a solvent used for performing a solvent-dry cleaning comprising an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the contaminantsprocess, wherein~~solvent~~ cleaning process utilizes a solvent-based cleaning fluid comprising cyclic siloxane solvent.

11. (currently amended) The solvent contaminant detection device of claim 10 wherein said electromagnetic source is an ultraviolet source and said electromagnetic detector is an ultraviolet detector~~comprising an electromagnetic device responsive to contaminant absorbance of electromagnetic radiation.~~

12. (currently amended) The solvent contaminant detection device of claim 1011 wherein said electromagnetic source is an infrared source and said electromagnetic detector is~~device consists of a detector selected from the group consisting of an ultraviolet detector and an infrared detector.~~

13. (currently amended) The solvent contaminant detection device of claim 1011 wherein said electromagnetic device comprises an ultraviolet detector including an ultraviolet source, a flow-through cell for passing samples of the~~siloxane~~ solvent from a fluid regeneration device, and an ultraviolet detector responsive to ultraviolet radiation radiated from the ultraviolet source through the flow-through cell.

14. (currently amended) The solvent contaminant detection device of claim 13 including wherein said ultraviolet device further comprises a filter that is configured to pass ultraviolet frequencies in a bandpass responsive to the presence of contaminants likely to accumulate in the solvent.

15. (currently amended) The solvent contaminant detection device of claim 14 wherein said solvent contaminant detection device is coupled to a controller that is configured to generate a signal when a concentration of contaminants present in the solvent reaches a predefined limit.

16. (currently amended) The solvent contaminant detection device of claim 15 wherein said predefined limit is chosen to indicate degradation in a regeneration adsorption media in said fluid regeneration device.

17. (currently amended) The solvent contaminant detection device of claim 10 in combination with a turbidity sensor, wherein said turbidity sensor is configured to detect the presence of particulates in the solvent that are readily visible, and said solvent contaminant detection device is configured to detect the presence of dissolved contaminants in the solvent that are not readily visible.

18. (currently amended) An article cleaning apparatus comprising:
a controller that is configured to control a cleaning process, including at least a solvent cleaning process, wherein said solvent cleaning process that utilizes a solvent based cleaning fluid comprising a cyclic siloxane solvent; and a solvent contaminant detection device that is configured to detect the presence of dissolved contaminants in the solvent using an electromagnetic source and an electromagnetic detector responsive to absorbance of electromagnetic radiation by the dissolved contaminants, and is the detector coupled to the controller to generate a signal indicative of when to replace a regeneration adsorption media that purifies used for purifying the cleaning fluid in response to detecting the dissolved contaminants.

19. (new) The article cleaning apparatus of claim 18 wherein the dissolved contaminants include fatty acids and esters that are not readily visible, the electromagnetic source is an ultraviolet source and the electromagnetic detector is an ultraviolet detector that is response to ultraviolet radiation in a spectral band where the absorbance of the ultraviolet radiation by the dissolved fatty acids and esters has a substantially linear relationship to a concentration of the dissolved fatty acids and esters in the solvent.

20. (new) The article cleaning apparatus of claim 18 further comprising a display that notifies an operator to replace the regeneration adsorption media in response to the signal.

21. (new) A dry cleaning apparatus comprising:
a cleaning basket assembly that holds articles that are cleaned by a cleaning fluid that includes a solvent;
an air management mechanism that provides air intake and air outtake for the cleaning basket assembly;
a fluid regeneration device that purifies the solvent; and
a solvent contaminant detector that detects dissolved contaminants in the solvent by measuring absorbance of ultraviolet or infrared radiation by the dissolved contaminants.

22. (new) The apparatus of claim 21 wherein the cleaning fluid includes a cyclic siloxane solvent.

23. (new) The apparatus of claim 21 wherein the cleaning fluid passes sequentially through the fluid regeneration device and the solvent contaminant detector.

24. (new) The apparatus of claim 21 wherein the dissolved contaminants are fatty acids and esters.

25. (new) The apparatus of claim 21 wherein the dissolved contaminants are not readily visible.

26. (new) The apparatus of claim 21 wherein the solvent contaminant detector measures absorbance of ultraviolet radiation by the dissolved contaminants.

27. (new) The apparatus of claim 26 wherein the solvent contaminant detector measures the absorbance of the ultraviolet radiation in a spectral band where the absorbance of the ultraviolet radiation is proportional to a concentration of the dissolved contaminants in the solvent.

28. (new) The apparatus of claim 26 wherein the solvent contaminant detector measures the absorbance of the ultraviolet radiation in a spectral band where the absorbance of the ultraviolet radiation has a substantially linear relationship to a concentration of the dissolved contaminants in the solvent.

29. (new) The apparatus of claim 26 wherein the solvent contaminant detector measures the absorbance of the ultraviolet radiation in a spectral band from about 200 nm to about 350 nm.

30. (new) The apparatus of claim 26 wherein the solvent contaminant detector measures the absorbance of the ultraviolet radiation in spectral bands situated at 220-230 nm and 270-280 nm.

31. (new) The apparatus of claim 26 wherein the solvent contaminant detector measures the absorbance of the ultraviolet radiation in spectral bands situated at approximately 223 nm and 274 nm.

32. (new) The apparatus of claim 21 wherein the apparatus notifies an operator in response to the dissolved contaminants exceeding a predetermined concentration.

33. (new) The apparatus of claim 32 wherein the apparatus notifies the operator to replace a regeneration cartridge in the fluid regeneration device, and the regeneration cartridge includes a cleaning fluid regeneration adsorption media.

34. (new) The apparatus of claim 21 wherein the apparatus includes a working fluid device that passes the cleaning fluid and discharges water, and the cleaning fluid passes sequentially through the working fluid device, the fluid regeneration device and the solvent contaminant detector.

35. (new) The apparatus of claim 21 wherein the fluid processing mechanism includes a clean fluid device that provides a storage tank for the cleaning fluid, and the cleaning fluid passes sequentially through the fluid regeneration device, the solvent contaminant detector and the clean fluid device.

36. (new) The apparatus of claim 21 wherein the apparatus includes an optical turbidity sensor that detects readily visible particulates in the solvent.

37. (new) The apparatus of claim 21 wherein the apparatus includes a solvent sensor that detects the cleaning fluid in an airflow that circulates between the air management mechanism and the cleaning basket assembly.

38. (new) The apparatus of claim 21 wherein the apparatus includes first and second regeneration cartridges, and the cleaning fluid passes sequentially through the first regeneration cartridge, the solvent contaminant detector and the second regeneration cartridge.

39. (new) The apparatus of claim 38 wherein the first regeneration cartridge is removed, the second regeneration cartridge replaces the first regeneration cartridge and a third regeneration cartridge replaces the second regeneration cartridge in response to the dissolved contaminants exceeding a predetermined concentration.

40. (new) A dry cleaning apparatus comprising:

- a cleaning basket assembly that includes a rotating basket with a plurality of holes, wherein the rotating basket holds articles that are cleaned by a solvent based cleaning fluid;
- an air management mechanism that provides air intake and air outtake for the cleaning basket assembly;
- a fluid regeneration device that includes a regeneration cartridge that includes a cleaning fluid regeneration adsorption media that purifies the solvent;
- a solvent contaminant detector that detects a concentration of dissolved contaminants in the solvent that are not readily visible by measuring absorbance of ultraviolet or infrared radiation by the dissolved contaminants; and
- a display that notifies an operator to replace the regeneration cartridge in response to the concentration of the dissolved contaminants exceeding a predetermined concentration.

41. (new) The apparatus of claim 40 wherein the regeneration cartridge includes a mechanical filter with a mesh size of about 50 microns to about 1000 microns, and the cleaning fluid passes sequentially through the mechanical filter and the cleaning fluid regeneration adsorption media.

42. (new) The apparatus of claim 40 wherein the regeneration cartridge includes a particulate filter with a mesh size of about 0.5 microns to about 50 microns, and the cleaning fluid passes sequentially through the particulate filter and the cleaning fluid regeneration adsorption media.

43. (new) The apparatus of claim 40 wherein the regeneration cartridge includes a water adsorption media, and the cleaning fluid passes sequentially through the water adsorption media and the cleaning fluid regeneration adsorption media.

44. (new) The apparatus of claim 40 wherein the regeneration cartridge includes a mechanical filter with a mesh size of about 50 microns to about 1000

microns, a particulate filter with a mesh size of about 0.5 microns to about 50 microns and a water adsorption media, and the cleaning fluid passes sequentially through the mechanical filter, the particulate filter, the water adsorption media and the cleaning fluid regeneration adsorption media.

45. (new) The apparatus of claim 40, further comprising a solvent turbidity detector that detects a concentration of particulates in the solvent that are readily visible by measuring absorbance of optical radiation by the particulates.